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2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

SUBJ: Evaluation of the status of **Rhodia, Inc.** under the RCRIS Info Corrective Action Environmental Indicator Event Code CA750
EPA I.D. Number: **SCD 003 358 389**

FROM: Marianna DePratter, Hydrogeologist III
RCRA Hydrogeology Section 1
Division of Hydrogeology
Bureau of Land and Waste Management

THRU: Jack Gelting, Manager
RCRA Hydrogeology Section 1
Division of Hydrogeology
Bureau of Land and Waste Management

TO: G. Kendall Taylor, Director
Division of Hydrogeology
Bureau of Land and Waste Management 9/18/02

Narindar Kumar, Chief
RCRA Programs Branch
US EPA, Region IV

DATE: September 18, 2002

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of the status of Rhodia Inc., located in Charleston, South Carolina, in relation to the Migration of Contaminated Groundwater Under Control (CA750) corrective action event code defined in the Resource Conservation and Recovery Information System (RCRA Info). An evaluation of Rhodia's status in relation to the Current Human Exposures Under Control (CA725) corrective action event code was completed September 11, 2001 under separate cover.

Concurrence by the RCRA Hydrogeology Section I Manager and the Division of Hydrogeology Director is required prior to entering these event codes into RCRA Info. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendation is satisfied by dating and signing at the appropriate location within Attachment 1.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This is the second evaluation for Rhodia, Inc. with regard to the CA750 corrective action event code. The first evaluation of Rhodia's status with regard to both the CA725 and CA750 corrective action event codes was completed June 4, 1998. Based on information available at the time of the first evaluation a status code of "NO" – "facility does not meet definition" was entered for CA725 and a status code of "NO" – "facility does not meet definition" was entered for CA750. Current human exposures were determined to be controlled (CA725-Yes) on September 11, 2001.

III. FACILITY SUMMARY

Rhodia, Inc., formerly known as Albright and Wilson Americas, is a chemical manufacturing facility located on the east bank of the Ashley River on the northern edge of the city of Charleston, South Carolina. The Rhodia, Inc. site has been a chemical manufacturing facility for over one hundred years. Currently, three dedicated process areas produce phosphoric acids and phosphorous halides. Five other process areas produce over three hundred distinct chemical products including phosphites, phosphates, alkyl chlorides, and phosphonates. Hazardous wastes are generated from solvent and condensate recovery, reactor vessel cleanouts, sludge accumulation, product purification, and from clean-up operations.

A security fence surrounds the shipping/receiving and manufacturing areas of the facility. The Ashley River defines the western boundary of the site. Rhodia, Inc. employs security personnel to guard the entrance to manufacturing areas of the plant.

The primary groundwater contaminants of concern at Rhodia, Inc. are arsenic, 1,2-dichloroethane (EDC), and dichlorofenthion (DCFT). DCFT, an organophosphorus pesticide, is not a hazardous constituent as defined under R.61-79.261 Appendix VIII. At the present time, there is limited toxicological data available for this contaminant.

IV. HISTORY OF GROUNDWATER RELEASES AND REMEDIATION

Groundwater monitoring at Rhodia, Inc. was first conducted in 1981 at which time the site was owned and operated by Mobile Chemical Company. Eighteen groundwater monitoring wells, thirteen piezometers and eleven test borings were installed by Mobil in response to the development of a seep on the bank of the Ashley River. An odor of ammonia, detected within the zone of tidal influence, led to the discovery of the seep on October 6, 1981. The source of the ammonia was identified as the GPP Production Area (now the site of the GPU Production Area). A trench drain within the GPP/GPU Production Area was discovered to be leaking along a construction joint. Excavations around the unit revealed relatively large cavities within gypsum fill underlying the GPP/GPU Unit. The leak was repaired and cavities filled with concrete. In the course of repairing the trench drain, several additional leaks were discovered in a buried water supply pipe east of the SPP Production Area (currently the site of the former SPU Production Area or SWMU 35). The additional leaks were repaired upon discovery and Mobil initiated a leak assessment program along the buried water supply pipeline. During the course of this investigation, several additional seeps were identified along the riverbank, some of which contained DCFT.

The hydraulic relationship between the seeps and shallow groundwater underlying the site revealed an area of groundwater mounding associated with an old drainage ditch (SWMU 17 or the Old Organic Waste Ditch). The ditch was originally excavated to accommodate surface water drainage from the process area of the site. It eventually became filled with soil, cinders, silt, gypsum, and debris. The Old Organic Waste Ditch was

determined to be a path of preferential groundwater flow. Infiltration of groundwater into the permeable fill materials of the ditch was thought to create a small artesian head. The hydraulic head differential between groundwater stored within the debris filled ditch and the Ashley River caused the sand boils and seeps discovered on the bank of the river in the early 1980s. No direct source of DCFT was identified during the investigation. Today, DCFT is thought to be associated with sediments lining the bottom of the Old Organic Waste Ditch and the original release of DCFT probably occurred at the former SPU Production Area (SWMU 35). Seepage along the Ashley River was stopped by the construction of a clay interceptor wall perpendicular to and across the Old Organic Waste Ditch.

Albright and Wilson, who purchased the site from Mobile Chemical Company, reported a new release from the GPP/GPU Production Area in late 1995. In early November a spring formed adjacent to the production area and water discharging to the ground surface drained into the North Stormwater Drainage Ditch (SWMU 30) and into the North Stormwater Containment Pond (SWMU 28). The spring was observed following heavy rainfall and the amount of discharge was estimated to be 5 to 10 gallons per minute at its peak. According to Albright and Wilson, discharge from the spring ceased within a day after the rainfall stopped. Dibutyl hydrogen phosphite and related impurities were detected in water sampled from the spring. In 1996, as an interim corrective measure to control the discharge of contaminated groundwater from the spring, Albright and Wilson constructed three groundwater interceptor trenches north, south, and west of the GPP/GPU Unit. Groundwater is now pumped from the trenches and discharged to the plant's wastewater treatment facility.

On June 17, 1991 a tank containing 1,2-dichloroethane (EDC) at the former SPU Production Area exploded with a resultant fire. Much of the tank's contents and water used to control the fire drained into SWMU 30, which is routed to SWMU 28. Subsequent to the emergency, the contents of SWMU 30 were sampled in order to determine if the water in the pond was in compliance with requirements of National Pollution Discharge Elimination System (NPDES) permit SCR 00000. Arsenic and EDC were detected in water samples from the pond, and so the discharge to the Ashley River was terminated. Stormwater managed at SWMU 28 is now treated on site and discharged to the public sewer system. In 1992, Albright and Wilson installed eight monitoring wells in the process area of the site to identify the source of arsenic, and to delineate the extent of arsenic and EDC contamination in groundwater. These six monitoring wells were sampled once during the 1992 assessment. DCFT, acetone, phenol, dichlorophenol, and 2,4 dichlorophenol were detected, in addition to the arsenic and EDC that prompted the investigation.

Groundwater contamination was further assessed at Rhodia, Inc. during the Phase I (1995) and Phase II (1999) RCRA Facility Investigations. The concentrations of EDC and arsenic dissolved in groundwater documented to be discharging to the Ashley River during the Phase I and II RCRA Facility Investigations prompted the Department to request an interim measure for groundwater (Sherritt to Tims, 12/9/99). An interim remediation plan for groundwater was submitted July 2000 and subsequently approved December 2000. A groundwater interceptor trench, approximately 1000 feet long, was excavated adjacent to the Ashley River in October of 2001. The groundwater recovery system components were installed, tested, and debugged from mid October to the middle of December 2001. The recovery system operated intermittently from December 2001 through April 2002. Recovery wells and associated piezometers were surged on three separate occasions (March 6, March 22, and April 6, 2002) to clear silt from the recovery well screens. Recovery wells extracting contaminated groundwater at the GPP/GPU interceptor trenches were also desilted in late 2001. Over a million gallons of groundwater have been recovered from the GPP/GPU interceptor trench in 2002 and potentiometric surface maps reflect hydraulic control at this production unit for the first time since trench installation in 1996.

Initial potentiometric data from the five recovery wells and six piezometers installed within the interceptor trench installed adjacent to the Ashley River also indicate the development of hydraulic control. Data collected from April 1 to April 10, 2002 indicate that water levels at recovery wells RW-1 through RW-5

decreased by 9.2 feet, 9.9 feet, 12.1 feet, 8.5 and 6.8 feet, respectively. Water level drawdowns at piezometers PZ-1 through PZ-6 for the same period were 7.6 feet, 8.7 feet, 11.6 feet, 10.2 feet, 9.6 feet, and 5.7 feet, respectively. If properly maintained and operated, groundwater extraction from the trench should successfully intercept the groundwater contaminant plume emanating from the process area of the site before it can discharge to the Ashley River.

V. CONCLUSION FOR CA750
(Brief Outline of Issues Leading to an EI of YE, NO or IN)

A groundwater interceptor trench, approximately 1000 feet long, was excavated adjacent to the Ashley River in October of 2001 as an interim corrective measure. Initial potentiometric data from the five recovery wells and six piezometers installed within the interceptor trench indicate the development of hydraulic control. Data collected from April 1 to April 10, 2002 indicate that water levels at recovery wells RW-1 through RW-5 decreased by 9.2 feet, 9.9 feet, 12.1 feet, 8.5 and 6.8 feet, respectively. Water level drawdowns at piezometers PZ-1 through PZ-6 for the same period were 7.6 feet, 8.7 feet, 11.6 feet, 10.2 feet, 9.6 feet, and 5.7 feet, respectively. If properly maintained and operated, groundwater extraction from the trench should successfully intercept the groundwater contaminant plume emanating from the process area of the site before it can discharge to the Ashley River. Therefore, the migration of contaminated groundwater at Rhodia, Inc. appears to be controlled.

VI. SUMMARY OF FOLLOW-UP ACTIONS

During the initial phase of operation, Rhodia Inc. had to desilt the groundwater recovery wells within the interceptor trench biweekly to monthly. Rhodia Inc. inspected the recovery system weekly until June 2002, biweekly June through August, 2002, and monthly after August 2002. During the monthly inspections (recovery well and holding tank pumps, control panel, etc), Rhodia, Inc. measures water levels within the recovery wells and Piezometers, and records the total gallons pumped from each recovery well. The monthly operation and maintenance data is reported to the Department quarterly, along with water quality analytical data from all groundwater monitoring wells at the site.

MPD/mpd
Attachment

cc: Shelly Sherritt, Section Manager, Operations Engineering Section, BLWM
Wayne Fanning, District Director, Trident EQC District Office

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRA Info Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Rhodia Inc. (Formerly Albright and Wilson Americas, Inc.
Facility Address: 2151 King Street Extension
Facility EPA ID #: SCD 003 358 389

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes - check here and continue with #2 below,

   _____ If no - re-evaluate existing data, or

   _____ If data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and

the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA INFO national database ONLY as long as they remain true (i.e., RCRA INFO status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):
Arsenic and 1,2-dichloroethane are the primary groundwater contaminants with regard to widespread distribution and elevated dissolved phase concentrations. Both contaminants exceed their respective Safe Drinking Water Act (SDWA) Maximum Contaminant Levels. See Reference 3 and Reference 5.

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

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1 "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

2 "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Rationale and Reference(s):
The construction of a groundwater interceptor trench downgradient of the process area and adjacent to the Ashley River effectively captures the groundwater contaminant plume, preventing plume migration. See Reference 7.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

__X__ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):
Prior to December 2001, contaminated groundwater discharged to the Ashley River. Construction of a groundwater interceptor trench downgradient of the process area, and adjacent to the Ashley River effectively captures the groundwater contaminant plume, preventing plume migration. See Reference 7.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):_____

3 As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater: OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):_____

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling measurement events. Specifically identify the well measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

____ If no - enter "NO" status code in #8.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):
Rhodia, Inc. currently inspects the recovery system (pumps, control panel, holding tank) monthly. Rhodia Inc. measures water levels in the recovery wells and piezometers, and records the total gallons pumped from each recovery well monthly. The monthly operation and maintenance data is reported to the Department quarterly along with piezometric and water quality data from all groundwater monitoring wells at the site. See Reference 7.

8. Check the appropriate RCRA INFO status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Rhodia, Inc.** facility, EPA ID #**SCD 003 358 389,** located at 2151 King Street Extension, Charleston, South Carolina. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date 9/18/02
(print) Marianna DePratter, P.G.
(title) Hydrogeologist III

Supervisor (signature) _____ Date 9/18/02
(print) Jack Gelting, P.G.
(title) Section Manager
Division of Hydrogeology
Bureau of Land & Waste Management
S.C. Dept.of Health and Environmental Control

Locations where References may be found:

SCDHEC
Bureau of Land and Waste Management
8901 Farrow Road, Suite 109
Columbia, SC 29203

USEPA Region 4
RCRA Programs Branch
Waste Management Division
61 Forsyth Street
Atlanta, GA 30303

Contact telephone and e-mail numbers

(name) Marianna DePratter
(phone #) (803) 896-4018
(e-mail) depratmp@dhec.state.sc.us

References:

1. Design and Installation of Ground-water Monitoring System, Mobil Chemical Company, Phosphorus Division Site, Charleston, South Carolina, Law Engineering Testing Company, dated August 4, 1981

2. North Stormwater Containment Pond, EDC and Arsenic Contamination Investigation, final report for Albright & Wilson Americas, Charleston Heights, South Carolina, Lane Environmental Services Corporation, dated September 1992

3. Phase I RCRA Facility Investigation Report, Albright and Wilson's Charleston Plant, Geosciences Inc. Engineering Consultants, dated February 1995

4. Memorandum of Agreements and Response to Comments, Phase I RCRA Facility Investigation Report, Geosciences Inc. Engineering Consultants, dated January 1997

5. Phase II RCRA Facility Investigation Report, A&W's Charleston Plant, Albright & Wilson Americas, Inc., Charleston, South Carolina, Geosciences Inc. Engineering Consultants, dated July 1999

6. Response to SCDHEC's Comments Phase II RFI Report, Rhodia's Charleston Plant, SCD 003358 389, Charleston, South Carolina, Geosciences Inc. Engineering Consultants, dated September 2001

7. Report of Implementation of Interim Remediation Plan for Groundwater, Rhodia's Charleston Plant, SCD 003358 389, Charleston, South Carolina, Geosciences Inc. Engineering Consultants, dated April 2002

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QUICK REFERENCE FOR STATUS OF ENVIRONMENTAL INDICATORS					
Name and EPA I D Number	Location (City or Town)	Current CA725 Decision	Current CA750 Decision	If Current Decision is Negative, Projected Date for Positive EI	
				CA725	CA750
Rhodia, Inc (Formerly Albright & Wilson Americas, Inc) SCD 003 358 389	Charleston, South Carolina	YE	NO		Dec 31, 2002

DATE September 11, 2001

SUBJ Evaluation of Rhodia, Inc 's status under the RCRIS Corrective Action Environmental Indicator Event Code CA725
EPA I D Number SCD 003 358 389

FROM Duke Taylor
Operations Engineering Section
Division of Waste Management
Bureau of Land and Waste Management

THRU Shelly Sherritt, Section Manager S. Sherritt
Operations Engineering Section
Division of Waste Management
Bureau of Land and Waste Management

TO John T. Litton, P E , Director
Division of Waste Management
Bureau of Land and Waste Management

Narinder Kumar, Branch Chief
RCRA Program Branch
Waste Management Division
U S EPA Region IV

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of Rhodia's status in relation to the following corrective action event code defined in the Resource Conservation and Recovery Information System (RCRIS)

Current Human Exposures Under Control (CA725),

Concurrence by the Bureau of Land and Waste Management Division of Waste Management's Director is required prior to entering these event codes into RCRIS Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendation is satisfied by dating and signing at the appropriate location within the following attachment (Attachment 1)

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the second evaluation for Rhodia The earlier Environmental Indicator Evaluation was completed June 4, 1998 Data generated during Rhodia's 1994 Phase I RCRA Facility Investigation confirmed the presence of soil and groundwater contamination above health-based concentrations at the site Elemental phosphorous in the sediments of the Ashley River was also a concern due to its ability to spontaneously ignite when exposed to air during low tide Dichlorofenthion (DCFT), a compound for which limited toxicological data exists, is also present in soils and groundwater at the site Because of concentrations of both metals and VOCs above risk-based levels in soils, the presence of DCFT in the soils and the concern with exposure to spontaneously igniting elemental phosphorous in the Ashley River sediments, a score of CA 725 NO was assigned during the June 4, 1998 Environmental Indicator Evaluation

The 1994 Phase I RCRA Facility Investigation also revealed groundwater contamination throughout the site Groundwater at the site is contaminated with arsenic, 1,2-dichloroethane (EDC) and DCFT The groundwater is currently discharging into the Ashley River and has been documented as discharging into the Ashley River as early as 1981 Rhodia has attempted to intercept the flow of contaminated groundwater at the process area of the site by installation and operation of three groundwater interceptor trenches adjacent to and downgradient of the GPU Production Area, however, these trenches have not been successful Therefore, a score of CA 750 NO was assigned to Rhodia during the June 4, 1998 Environmental Indicator Evaluation

III. FACILITY SUMMARY

Rhodia Inc , formerly known as Albright and Wilson Americas, Inc , is a chemical-producing plant located on the east bank of the Ashley River on the northern edge of Charleston, South Carolina, just inside the city limits Three dedicated units produce phosphoric acids and phosphorous halides Five other units produce over 300 distinct chemical products including phosphates, phosphates, alkyl chlorides, and phosphonates Hazardous wastes are generated from solvent and condensate recovery, reactor cleanouts, sludge accumulation, product purification and clean-up operations

The active portion of the facility is bordered by a security fence and Rhodia employs security personnel to guard the entrance to manufacturing areas of the plant The western portion

of the plant is bordered by the Ashley River

Results from the Phase I and Phase II sampling events show that the primary contaminants of concern at Rhodia include the following arsenic, lead, EDC and DCFT DCFT is not a hazardous constituent as defined under R 61-79 261 Appendix VIII and, at the present time, there is limited toxicological data available for this contaminant

IV. CONCLUSION FOR CA725

The determination of a score of NO for CA725 in the previous Environmental Indicator Evaluation was based primarily on the exposed phosphorous-contaminated sediments in the Ashley River This area has been used for both fishing and recreational purposes in the past, and there is a history of encounters of fishermen with the phosphorous contamination in the sediments On July 25, 1999 DHEC approved an interim measures workplan submitted by Rhodia to install a geo-textile cover over the phosphorous-impacted area of the Ashley River sediments Installation of the cover began on Sept 8, 2000 and was completed on Sept 20, 2000 The purpose of this cover was to keep phosphorous-contaminated sediments both moist and stabilized during low tide, when the sediments would be exposed to air Thus far the cover has been effective at doing these two things, thus eliminating any human exposure pathways to the phosphorous-contaminated sediments Furthermore, the majority of the soils across the site impacted with elevated levels of metals and organic compounds are covered with asphalt, structures, vegetation or other landscape covers, thus eliminating worker exposure to these soils Therefore, there is no significant threat of human exposure to soils contaminated with metals and chemicals at concentrations above risk-based levels A status code of CA725 YE is recommended for this site

V. CONCLUSION FOR CA750

A groundwater interceptor trench is currently being installed at Rhodia to intercept all groundwater that is migrating into the Ashley River Therefore, further evaluation of groundwater migration control for this site will be deferred until December 2002, approximately a year after the starting operation date of the interceptor trench The current status code of CA750 NO is recommended until this date

VI. SUMMARY OF FOLLOW-UP ACTIONS

Rhodia has submitted two separate interim measure workplans to address both human exposure risks to elemental phosphorous in sediments of the Ashley River and

groundwater migration at the facility The Interim Measure Workplan for Elemental Phosphorous Stabilization was submitted in September 1998 and approved by the Department on June 25, 1999 Completion of this project was done on September 20, 2000 The Interim Remediation Plan for Groundwater was submitted in July 2000 and approved in December 2000 Installation of a groundwater interceptor trench is currently in progress and should be completed by December 2001

Version Interim Final
2/5/99

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name. Rhodia, Inc (Formerly Albright and Wilson Americas Inc)
Facility Address. 2151 King Street Extension Charleston, SC 29405-6124
Facility EPA ID #: SCD 003 358 389

1 Has **all** available relevant significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e g , from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

_X_ If yes - check here and continue with #2 below,

____ If no - re-evaluate existing data, or

____ If data are not available skip to #6 and enter"IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e g , reports received and approved, etc) to track changes in the quality of the environment The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater An EI for non-human (ecological) receptors is intended to be developed in the future

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i e , contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i e , site-wide))

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA) The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i e , potential future human exposure scenarios, future land and groundwater uses, and ecological receptors)

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i e , RCRIS status codes must be changed when the regulatory authorities become aware of contrary information)

2 Are groundwater soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Arsenic EDC (Phase I and II RFI Data)
Air (indoors)[2]		X		*Phase II RFI Report
Surface Soil (e g , <2 ft)	X			Arsenic, Lead, EDC, DCFT (Phase I and II RFI Data)
Surface Water		X		*Phase II RFI Report
Sediment	X			Arsenic, elemental phosphorous (Phase I and II RFI Data)
Subsurface Soil (e g , >2 ft)	X			Arsenic, Lead, EDC. DCFT (Phase I and II RFI Data)
Air (outdoors)		X		*Phase II RFI Report

____ If no (for all media) - skip to #6 and enter "YE," status code after providing or citing appropriate "levels" and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation

____ If unknown (for any media) - skip to #6 and enter "IN" status code

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1 "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range)

2 Recent evidence (from the Colorado Dept of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks

Rationale

* There are no occupied buildings covering the EDC- and DCFT-contaminated areas, and existing cover will prevent wind release of surface soil particulate for the majority of impacted areas Conservative modeling indicates that arsenic impact on the Ashley River at the point of discharge results in a concentration of 0 05 ug/l, which is unlikely to threaten human health

3 Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table
Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food [3]
Surface Soils	No	No	No	Yes	N/L	N/L	No
Sub-surface Soils	No	No	No	Yes	N/L	N/L	No
Sediments	No	No	No	Yes	N/L	N/L	No
**Groundwater	See note under Rationale						

Instructions for Summary Exposure Pathway Evaluation Table

1 For Media which are not "contaminated" as identified in #2, please strike-out specific Media, including Human Receptors' spaces, or enter "N/C" for not contaminated

2 Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway)

Note In order to focus the evaluation to the most probable combinations, some potential "Contaminated" Media - Human Receptor combinations (Pathways) are not assigned spaces in the above table (i e, **N/L - not likely**) While these combinations may not be probable in most situations, they may be possible in some settings and **should be added as necessary**

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e g , use optional Pathway Evaluation Work Sheet to analyze major pathways)

_X_ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation

[3] Indirect Pathway/Receptor (e g , vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc)

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s) On-site workers construction workers and recreational fishermen are the only groups considered in determining human exposure pathways since these are the receptors with any likelihood of coming into contact with this site Virtually all contaminated soils are covered by asphalt, structures, vegetation or other landscape covers (Phase II RFI Report), thus eliminating the on-site worker exposure to surface and sub-surface soils In September 2000, Rhodia installed a geotextile cover over the phosphorous-contaminated sediments in the Ashley River, preventing any exposure to on-site workers or recreational fishermen to these sediments In case of any construction activities, OSHA-required health and safety precautions will be followed to limit release of and contact with subsurface soil contamination, and limited respiratory exposure during such activities will be controlled

**Groundwater will be re-evaluated in December 2002, approximately a year after installation of the groundwater-interceptor trench The current CA750 status of NO will therefore be recommended until this time

4 Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be 1) greater in magnitude (intensity, frequency and or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination") or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

__X__ If no (exposures can not be reasonably expected to be significant (i e , potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant "

____ If yes (exposures could be reasonably expected to be "significant" (i e , potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant "

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s) See Rationale for Answer to Question #3

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[4] If there is any question on whether the identified exposures are "significant" (i e , potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e g , a site-specific Human Health Risk Assessment)

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially unacceptable ' exposure

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s) _____

6 Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility)[5]

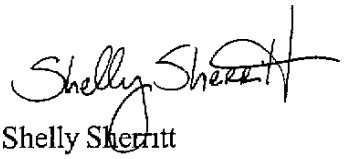
__X__ YE - Yes, "Current Human Exposures Under Control" has been verified Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Rhodia Inc facility, EPA ID # SCD 003 358 389, located at 2151 King Street Extension, Charleston, South Carolina under current and reasonably expected conditions This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility

____ NO - "Current Human Exposures" are NOT "Under Control "

____ IN - More information is needed to make a determination

Completed by  Date September 11, 2001

Duke Taylor
Engineer Associate II

Supervisor  Date September 11, 2001

Shelly Sherritt
Section Manager
Division of Waste Management
Bureau of Land and Waste Management

Locations where References may be found
Bureau of Land and Waste Management, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201

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5 FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G , SITE-SPECIFIC) ASSESSMENTS OF RISK.

Contact telephone and e-mail numbers

Duke Taylor
803 896 4163
taylorwf@dhec state sc us

Marianna DePratter
803 896 4018
depratmp@dhec state sc us